# Present performance of the $^{10}$Be / $^{14}$C / $^{26}$Al AMS system at GNS science and modeling how $^{10}$Be beam transport can be improved

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The eXtended Carbon AMS system at GNS Science (XCAMS), based on NEC's design for the 0.5 MV Pelletron CAMS, has been in operation for 3 years. It is the first such commercial system with a capability to measure also $^{10}$Be and $^{26}$Al below/near 1 MeV. For $^{10}$Be AMS, the $^{10}$B isobar is rejected through the use of a 50 – 75 nm thick silicon–rich nitride foil as energy degrader between the momentum *(p/q)* and energy *(E/q)* analyzers. The extension with an additional magnet rejects charge–exchanged $^{9}$Be during mass 26 injection. While the main focus has been on routine and high–precision modes of radiocarbon measurement, significant effort has gone into researching how transport efficiency for $^{10}$Be AMS can be improved. Beam optics calculations, incorporating realistic parameterizations of straggling effects in the stripper gas and energy degrader, in conjunction with measured beam profiles, show that the present setup downstream from the electrostatic analyzer is not optimal with regards to rejecting $^{10}$B and accepting $^{10}$Be.

We will present actual realized values of key quality control parameters, such as $^{14}$C/$^{12}$C and $^{10}$Be/$^{9}$Be ratios for the blanks and repeatability of $^{14}$C and $^{10}$Be standards, and we will discuss a plan to improve the transport efficiency of $^{10}$Be, by modifying how the beam is focused through the additional magnet into the acceptance of the gas–ionization detector.